

Precision Mobile-Joint and Latching Technologies for Deployable Optical Systems, Phase I

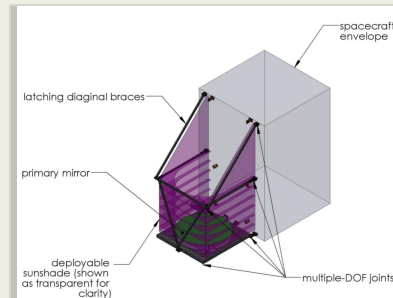
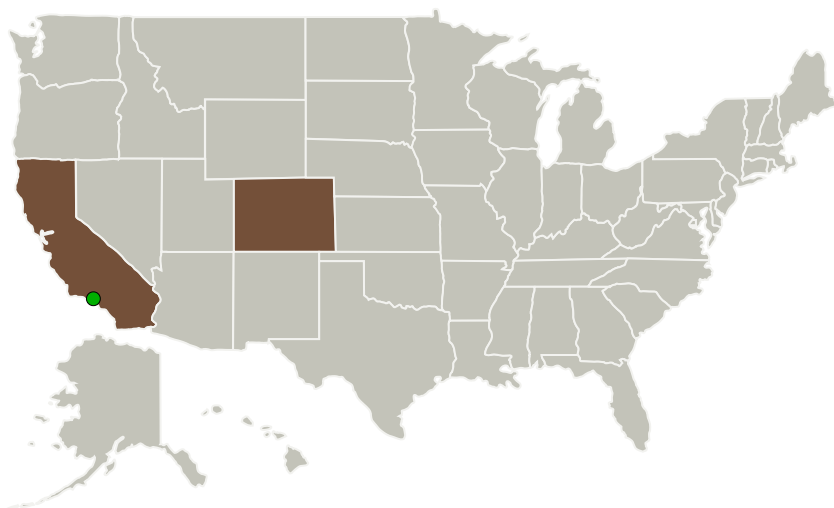
Completed Technology Project (2014 - 2014)



Project Introduction

Planned future NASA missions in astrophysics will push the state of the art in current opto-mechanical technologies. Specifically, precision deployable structures will be required to facilitate large aperture deployable optical telescopes given current and foreseeable payload volumes. Fundamental to these deployable structures are enabling components that are capable of precise, repeatable deployments and that are stable in the orbital environment. MMA Design LLC proposes to advance the state of the art in highly reliable and cost effective deployable optical systems by developing precision mobile-joint and latching technologies that are integral to a deployable optical telescope. This proposal focuses on research and development of innovative precision deployment technologies that initially target a 6U CubeSat to ESPA-class optical platform but that are highly scalable to 16 meter class or larger optical systems. The primary innovations in the development of the proposed precision deployable technologies include: ? Scalable System Design – The deployable system and components can be proportionally scaled to accommodate larger aperture systems. ? Repeatable Multiple Degree-of-Freedom Joints – Use of flexible elements and preloading of movable parts enables deployment repeatability and precision. ? High Performance at lower cost – The proposed approach utilizes innovative concepts for latching and joint mobility that will yield significant improvements in performance at lower system cost.

Primary U.S. Work Locations and Key Partners



Precision Mobile-Joint and Latching Technologies for Deployable Optical Systems Project Image

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Organizations Performing Work	Role	Type	Location
MMA Design LLC	Lead Organization	Industry	Loveland, Colorado
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Colorado

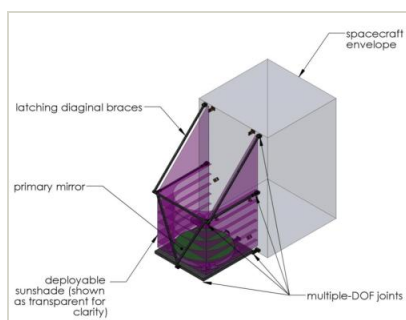
Project Transitions

**June 2014:** Project Start**December 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/137792>)

Images



Project Image

Precision Mobile-Joint and Latching Technologies for Deployable Optical Systems Project Image
(<https://techport.nasa.gov/image/136485>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MMA Design LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

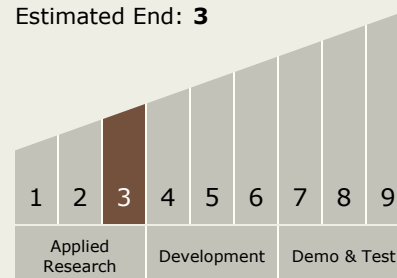
Carlos Torrez

Principal Investigator:

Timothy Ring

Technology Maturity (TRL)

Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.2 Observatories
 - └ TX08.2.2 Structures and Antennas

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System